



FACULTY OF MEDICINE, UNIVERSITY OF RUHUNA
SECOND EXAMINATION FOR MEDICAL DEGREES – JANUARY 2020
PHYSIOLOGY PAPER II

THREE HOURS

Answer all FIVE questions

Answer EACH QUESTION in a SEPARATE BOOK

Use diagrams where necessary

1. Different situations or disease conditions can lead to hypoxic hypoxia. It can occur in (a) individuals breathing air with low partial pressure of oxygen, (b) patients with ventilator failure, (c) patients with diffusion defects, (d) patients with congenital cardiac defects.

1.1 State **one** example for each of the situations/disease conditions (a-d) stated above. (10 marks)

1.2 Explain the mechanism of development of hypoxic hypoxia in each of the situations/disease conditions (a-d) stated above. (40 marks)

1.3 Explain whether oxygen therapy is useful or not useful in each of the situations/disease conditions (a-d) stated above. (30marks)

1.4 State the expected type of derangement of pH in each of the situations/disease conditions (a-d) stated above. (20 marks)

2.

2.1 Describe **two** possible consequences of increased **gastric acid** secretion. (30 marks)

2.2 Describe the regulation of secretion of **pancreatic juice**. (30 marks)

2.3 Describe the possible consequences of removal of a large portion of the stomach. (40 marks)

3. A patient with chronic kidney disease presents to a medical ward with a haemoglobin concentration of 7 g/dl. He has no history of chronic bleeding. His blood group is AB positive. A blood transfusion is started, and a few minutes later, he develops features of an acute transfusion reaction. Later it was revealed that the patient was transfused with incompatible blood due to a clerical error. On discharge, he is prescribed erythropoietin injections regularly.

- 3.1 Explain the basis for the prescription of regular erythropoietin injections to this patient. (30 marks)
- 3.2 Explain the basis of ABO blood group system. (40 marks)
- 3.3 Explain the mechanism of red cell lysis in incompatible blood transfusion. (30 marks)

4. A 45 year-old woman complains of night sweats and burning sensation of the body. She has no menstrual bleeding during the last eight months. Her serum levels of estrogen and progesterone were low, and serum levels of FSH and LH were high. She was diagnosed as reaching menopause. She was treated with combined estrogen and progesterone treatment.

- 4.1 Define the term menopause. (15 Marks)
- 4.2 Explain the physiological basis for the hormonal changes mentioned above. (50 marks)
- 4.3 List ten other post-menopausal symptoms that she could have. (20 marks)
- 4.4 Describe the effects of estrogen on the cardiovascular system. (15 marks)

5. Explain the physiological basis for the following

- 5.1 Use of Ishihara colour plates in testing colour vision. (25 marks)
- 5.2 Performing the caloric test to assess the vestibular functions. (35 marks)
- 5.3 Use of audiometry in differentiating neural deafness from conduction deafness. (40 marks)

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